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writing naturally depicted in many cases the same objects. Colonel Garrick Mallery, in his great volume on 'Picture Writing of the American Indian,' a publication of the Bureau of Ethnology, says: "The present collection shows the interesting psychologic fact that primitive, or, at least, very ancient man made the same figures in widely-separated regions, though it is not established that the same figures had a common significance." The rude pictographs of bow, sun, moon, eye and other objects may be found cut in rock throughout the world, but these coincidences do not indicate community of origin any more than do the rude stone arrow head and spear point which are world-wide in their distribution, and which Huxley said may be regarded as 'weapons of necessity.' Interesting coincidences do occur, as, for example, the Maya glyph for division is represented by an oblong oval figure with an inner oval outline having two vertical lines. This has been supposed to represent an obsidian knife. The Chinese ideogram for division represents a knife of another kind with two lines above representing a thing divided. The Egyptian glyph represents a knife like a chopper with a handle used in cutting leather, this also means division.

Mr. Chalfant gives a reproduction of rude characters found on fragments of tortoise shell and on bone arrow heads which were exhumed in the province of Honan in 1899. Many of these characters are rude pictures of objects, such as horse, stag, bird, scorpion, halberd, bow and arrow, wine-jar, hill, field and others. They are considered examples of the earliest writing of the Chinese. The profound difference between the Maya and associated glyphs of middle America, and the Chinese ideographs may be seen at a glance. Ranging over a period of 3,000 years, at least, the Chinese character has been in the form of lines either enclosing spaces as in sun, moon, field, etc., or lines running out from the figure like twigs from a tree. In the Maya and other glyphs of like character the lines of the drawing invariably enclose spaces. In other words the glyphs are made up of conventional drawings of skulls, feet, vessels, etc., in the solid. Here, indeed, one finds a funda-

mental difference in the two methods; the Maya glyph more nearly approaches the Egyptian hieroglyph in which the picture of the object is portrayed, though differing from the rude, conventionalized Maya in being drawn with remarkable fidelity and taste. The Maya glyphs have been derived from larger drawings, but in their condensed and abbreviated forms remind one of those shrunken and diminutive black human heads from South America, which though greatly reduced in size, still preserve the characteristics of the full-sized head. The Maya glyphs were evolved from more complex pictures, yet let one try to imagine a slow evolution of these glyphs at all paralleling the progressive development of Chinese characters and he is forced to admit their entire difference. As an example, take the modern Chinese character for turtle, and one can detect the back, the fore and hind legs, tail, etc.; the Maya glyph for turtle, on the contrary, represents the head alone with a few rudimentary designs below or at the sides, but unmistakable in its character with its recurved beak and peculiar turtle snout.

This brief review does scant justice to Mr. Chalfant's memoir, but we trust that his contributions may inspire others to enter this interesting field of research.

EDWARD S. MORSE.

Forest Mensuration. By HENRY SOLON GRAVES. New York, John Wiley and Sons. 1906. Pp. 458. 8vo.

That forestry is a business—the business of making a revenue from wood crops—is now perhaps grasped by even the most recent novice in the ranks of propagandists for forest preservation. Every business requires the measuring of financial effects; inquiries as to the profitableness of its operations—the statics of expenditure and return—occupy the manager of every business. So in forestry, the recurring inquiry is: Will it pay? Will the effort and expense of making a plantation or of leaving parts of a forest uncut to secure a natural regeneration find eventually its proper reward?

How complicated and difficult the answer to this question must be can be realized when

one contemplates the long time which is involved, the many changes to which the crop is subjected during that time, varying its rate of growth from period to period, and its character, which the forester must be able to foresee. Finally, where finances are involved, market conditions must also be predicted: the forester must be a seer!

As in the factory, cost of output and sale value of product are compared, so in forestry the cost of producing wood and its eventual sale value need to be placed in relation. But, before a financial calculation can be made, we must be able to measure the product itself, and the methods that are employed to measure the volume of trees or parts of trees, of stands, forests, and of their increments from period to period are comprised under the name of forest mensuration.

It was quite natural that the first American professional text-book of forestry, worthy of the name, should occupy itself with this branch of the subject, which is to a large degree basic of all other branches. Dealing mainly with mathematical questions, it was possible to bodily transfer the European knowledge and practise, ready for our use.

The art of forest mensuration, as all other branches of forestry, has naturally been mainly developed in Germany, and as regards methods of procedure in the measurement, especially of standing timber and of increment, the author could add little to the contents of the latest German text-books. But in the matter of measuring felled timber, especially logs, the American method of employing the board-foot or some similar standard gave opportunity to add the matter contained in chapters II. to V. on log rules and scaling of logs, which would naturally not be found in European literature, the necessity for which we consider, however, a national misfortune.

It is unfortunate that we are doomed to remain in the backwoods as regards our units of measurement. If it is a pity that we have not yet adopted the metric system, it is almost a sin that we persist in continuing the use of the absurd log scales, and we regret that Professor Graves has not used the opportunity

of inveighing more severely against this incubus.

There are not less than forty-five standards or units of measurement for logs employed in the United States, all varying in the board-foot contents they give for logs of the same cubical contents. It is a matter of experience that the results at the mill invariably belie the log scale. Professor Graves has treated this subject most fully and with an elaboration worthy of a better cause, admitting at the same time that 'the cubic foot will unquestionably be used more and more, as the value of timber increases and eventually replace the present rough unit, the board-foot.'

The other parts of the book are treated with similar clearness and elaboration, and the whole must be recognized as much a standard work—the first in the English language on the subject—as any of the best German text-books. Indeed, this book is in some respects an improvement by the addition of results of measurements in tables, which are usually not given in such text-books. The methods of estimating standing timber are also more elaborated than in European literature.

We welcome this contribution to professional forestry literature as distinctly an advance to our forestry movement.

B. E. FERNOW.

THE NUMBER OF KNOWN FERNS.

Few persons not familiar with fern literature can begin to appreciate the scattered nature of the information that must be gleaned and sifted in the systematic study of the ferns of any region outside of temperate North America and Europe. The last summary of the ferns of the world was published a generation ago (1874) and proved a most useful work, notwithstanding two facts: (1) that its conservative authors, throwing geographic distribution to the winds, often included from two to twenty species under the single name of one of their so-called species of general distribution; and (2) that the use of the Kew method of citation for the author of the species made it practically impossible to trace a given species to its original descrip-